QUICK SET-UP

The following steps will quickly lead you through set-up and adjustments. The sequence numbers refer to the drawing on the rear of the quick set-up. For details, please consult the following chapters.

SETTING UP

POWER OFF (1)
Switch off all equipment before connecting.

COMPUTER (2)
Connect the computer to the COMPUTER input using the GA (Graphics Adapter) cable and applicable computer and monitor adapters if needed.

SOUND (3)
Connect sound from the computer using a standard 3.5 mm stereo jack line cable (not supplied).

MOUSE (4)
Connect the mouse cable to the MOUSE connector of the projector. Use an applicable mouse adapter at the computer end.

MAINS (5)
Connect the power cords to the various equipment.

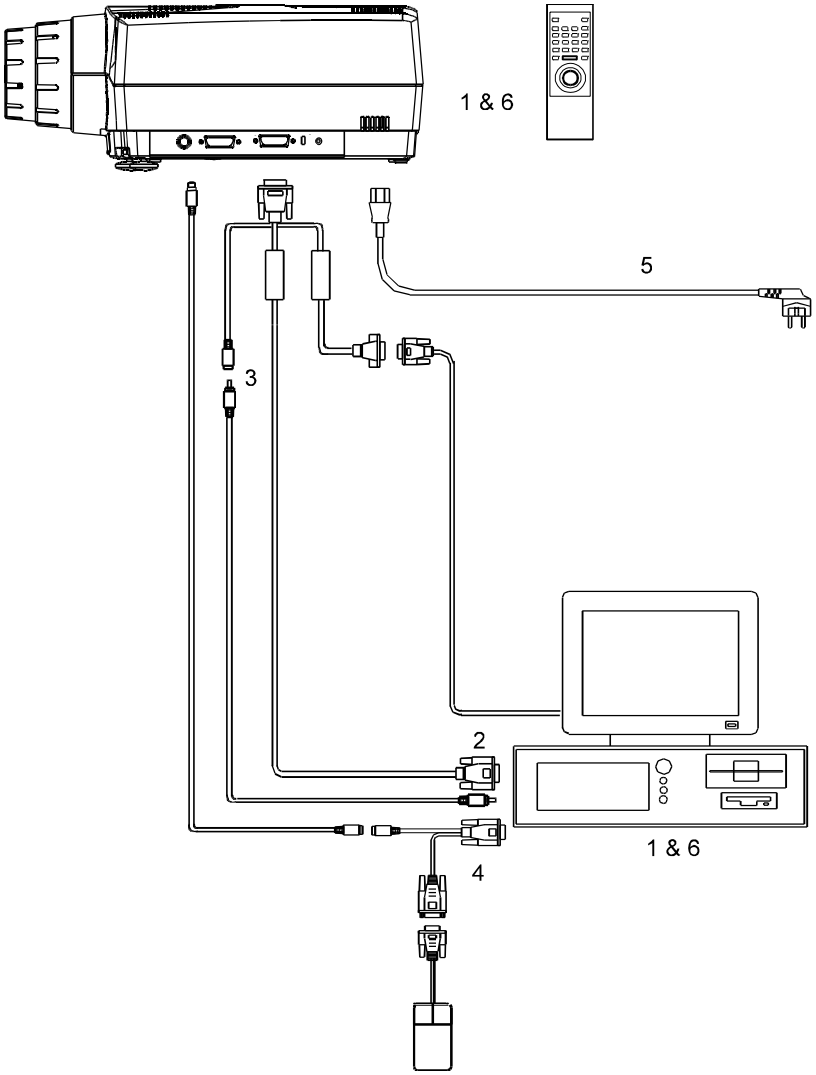
POWER ON (6)
First switch on the projector, then the source equipment to facilitate correct recognition of the projector as a peripheral unit to the computer.

USE

ZOOM , FOCUS AND POSITION
Zoom the lens for desired image size, focus the lens for an optically sharp image and tilt the unit using the integral adjustable feet to position the image on screen.

RESET
Press RESET to automatically adjust for position, width and stability. RESET is automatically invoked when a new source is connected.

CONTRAST AND BRIGHTNESS
Adjust CONTRAST and BRIGHTNESS as preferred.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The information contained in this User Guide, and the products described herein are subjected to change without prior notice.

1 INTRODUCTION

Thank you for purchasing this state of the art SVGA full color projector!

For long and lasting, safe and secure operation, please read this user guide, and follow the instructions given. Failing to do so may cause product failure that could void any warranties given, and in some cases be harmful and dangerous to people.

For the experienced user, a quick set-up guide is included at the beginning of this manual.

Please retain this user guide for future reference.

2 SYMBOL DESCRIPTIONS

DANGEROUS VOLTAGE
This symbol indicates the presence of high voltages inside the product. High voltages may constitute electric shock and may be lethal.

WARNING
This symbol alerts the user of important operating, maintenance (servicing) and safety-related instructions.

HOT
This symbol indicates hot surfaces.

NOTE
This symbol is used to highlight specific information for the user.

3 SAFETY INSTRUCTIONS

The following list of instructions is provided to ensure safe and risk free use and operation of the projector. Failing to read and follow these instructions may void any warranties and may also cause personal injury and material damage.

1. **READ INSTRUCTIONS** - All safety and operating instructions should be read before the projector is operated.

2. **RETAIN INSTRUCTIONS** - The safety and operating instructions should be retained for future reference.

3. **HEED WARNINGS** - All warnings on the projector and in the User Guide should be adhered to. If ignored, use of this projector may cause death, injury or material damage.

4. **CABLES AND CORDS** - Use only original cables and cords as supplied with the projector or as optional accessories. Using third party cables that may look identical may lead to material damage and personal injury, as the internal wiring in the cables may be different.

5. **LAMP LIFE** - The high pressure lamp may explode if improperly used. When the lamp life time is exceeded, the projector will issue a warning on screen at start up, and a red indicator on the projector will light up. Change lamp with an identical spare part as described elsewhere in this User Guide.

6. **LAMP BEAM** - Do not look directly into the projector or lens when operating the projector. The lamp emits rays of strong light which may cause eye injury and/or sunburns.

7. **WATER AND MOISTURE** - The projector is designed for indoor use only and should not be used near water and moisture.

8. **CARTS AND STANDS** - Place the projector on a stable, hard surface in a manner that does not obstruct ventilation ports and openings in the projector housing. Unstable carts, stands, tables and other arrangements may cause the projector to fall, which may cause serious injury to people and/or damaging the projector and other material.

9. **CEILING MOUNTING** - When mounting the projector in the ceiling, always ensure that all screws, bolts and other fixing devices of the ceiling mount hardware are securely in place and tightened. Use only well dimensioned ceiling mounts from a renowned supplier. Connect the

projector to a switched mains power supply, and switch off when not in use, for maximum protection against fire. Switching off using the remote control only puts the projector in a standby (sleep) mode with live internal voltages.

10. **VENTILATION** - Slots and openings in the projector housing are provided for ventilation. Air inlet filters are employed to reduce dust build-up internally. Periodically vacuum the filters (from the outside of the ventilation grilles) as needed. To ensure reliable operation of the projector and protection from overheating, do not block or cover slots or openings in any way. Do not insert any foreign objects or instruments into the slots and openings, as this may block the ventilation fans. Do not place the projector on a soft surface (carpet etc.). Never install the projector in an enclosed unit unless it is properly ventilated by a separate cooling system.

11. **HEAT** - The projector should be situated away from heat sources such as sunlight, radiators stoves or other strong heat sources. Do not operate the projector outside the maximum temperature specifications.

12. **OBJECT OR LIQUID ENTRY** - Care should be taken so that objects are not put or do not fall into the projector housing. Be careful not to spill liquids that may flow into the projector interior. Do not insert metal or flammable objects into the projector.

13. **POWER SOURCES** - The projector must only be connected to proper electrical voltage as marked on the projector body, on the label at the power inlet. The projector should be connected to the electrical outlet using a power cord compatible with the local electrical voltage. Never operate the projector outside the electrical voltage specification. If you are unsure about the type of electrical service at your location, please consult your dealer or local power company.

14. **POWER CORD PROTECTION** - Power cords should be routed so that they are not likely to be walked on, pinched or unduly bent by items placed upon or against them. Pay particular attention to cords and cables at the point where they exit from the projector.

15. **GROUNDING OR POLARIZATION** - Precautions should be taken so that grounding or polarization of the projector is maintained. Do not use a three prong to a two prong adapter.

16. **ELECTRICAL SHOCK** - To reduce the risk of electrical shock, do not open the unit. Refer all servicing to authorized personnel only.

17. **CLEANING** - The projector should be cleaned only as recommended, see the Maintenance section. Disconnect the power cord from the power outlet before cleaning. Do not use liquid, spray or aerosol cleaners.

18. **NON-USE PERIODS** - The power cord of the projector should be unplugged from the outlet when left unused for a long period of time.

19. **LAMP REPLACEMENT** - Replace projection lamp with same type and rating as shown in the Technical Data section. Allow unit to cool down before replacement.

20. **SERVICING** - The user should not attempt to perform unusual or technical service to the projector. Do not open the unit, except for the lamp replacement door. Refer all servicing to authorized personnel only. Replace damaged cords or cables with original replacement parts only.

21. **DAMAGE REQUIRING SERVICE** - The projector should be serviced by authorized personnel when:
    - objects have fallen, or liquid spilled, into the projector
    - the projector has been exposed to water or moisture
    - the projector does not appear to operate normally (fan not working, noise, smell, smoke, heat etc.)
    - the projector has been dropped or damaged

22. **ABNORMALITY** - If you detect any abnormal smell or smoke, immediately turn off the power switch. Disconnect the power plug from the inlet to prevent fire or electrical shock.

23. **LIFTING AND MOVING** - Let the projector cool down before moving. Disconnect the power cod and all other cables. Carry the unit by the handle provided. The projector should preferably be transported in a suitable case.

4 MAIN FEATURES

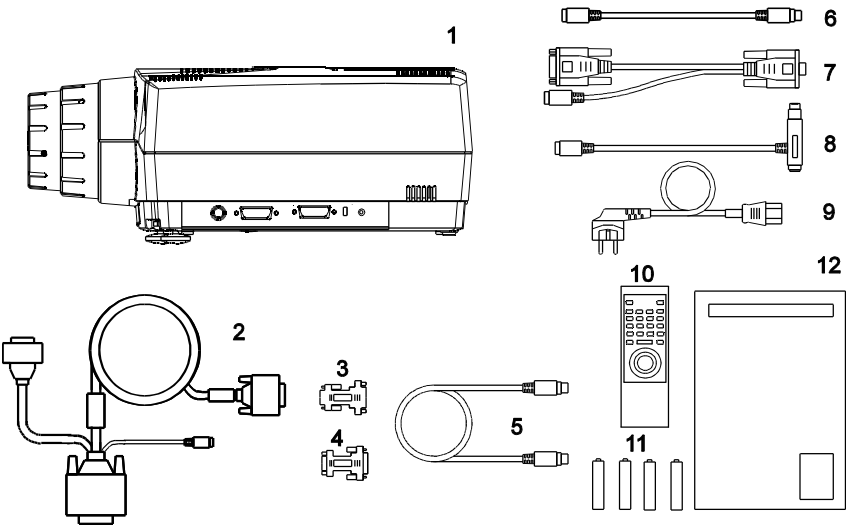
The unit employs the following important features that in total provide you with a highly functional and powerful projector:

- **High brightness image**
- **Compact, light and portable**
- **Automatic adjustments/set-up**
- **User replaceable Metal Halide lamp**
- **True SVGA 800 x 600 resolution**
- **640 x 480 to 1152 x 870 image compatibility**
- **16.7 million colors**
- **Stereo sound**
- **Infrared remote control with trackball mouse emulation**
- **Comprehensive menu system**
- **On screen display (OSD)**
- **User and source settings memorized**
- **Low noise cooling system**
- **False light blocking**
- **Power down management**

5 SUPPLIED MATERIAL

5.1 STANDARD MATERIAL

A complete set includes the following components :



1. LCD Projector
2. GA Cable (Graphics Adapter)
3. MAC computer adapter
4. MAC monitor adapter
5. Mouse Cable
6. Mouse Adapter PS/2
7. Mouse Adapter PC (Y-Split)
8. MAC Mouse Adapter
9. Power Cord
10. Remote Control
11. Batteries
12. User Guide

* Soft Case (not shown in drawing)

5.2 OPTIONAL MATERIAL

Optional cables, adapters and accessories are available. Consult your dealer for further information.

6 MAKING THE CONNECTIONS

The projector may be connected to different equipment. The following sections describe in detail how to connect to these systems.

See the illustration on the rear of the quick set-up card on how the various system parts connect together.

Be aware of static electricity that may build up in the dry season and when operating on synthetic carpets. Discharge any static electricity by touching a metallic surface before you start.

Place the projector on a table at a suitable distance to the projection screen. Select a screen with good reflectivity and avoid direct sunlight shining in. Place the projector so that the image is visible to the whole audience, and so that the unit does not obstruct the view. The projector is supplied with long cables for high flexibility in placement.

Various cables are supplied or optionally available to connect to different sources. Follow the list below in numerical order for a trouble-free set-up!

1. **SWITCH OFF** all equipment before making all the connections.

2. **COMPUTER GRAPHICS ADAPTER.**
   Computer graphics adapters use different connectors depending on the actual computer system in use. Connection to the projector is made through a basic GA cable and appropriate adapters.

   - **PC**. Use the GA cable directly to connect the graphics port of the PC to the COMPUTER connector on the projector. If needed, connect your monitor cable to the free branch on the GA cable.

   - **MAC**. Use the MAC adapters, as marked, on the computer end of the GA cable to adapt to the graphics-port connector and monitor connector on the MAC.

   - **NEC**. Use the optional NEC adapters, as marked, on the computer end of the GA cable to adapt to the graphics-port connector and monitor connector on the NEC.

3. **SOUND.**
   The GA cable has a sound input branch at the projector end. Connect sound from the computer using a standard 3.5 mm stereo jack line cable (not supplied).

4. **MOUSE.**
   To enable mouse control from the remote control, a connection is made using a mouse cable and various adapters. Connect the cable directly to the MOUSE connector on the projector. Connect the appropriate adapter to the free end of the mouse cable at the computer end as described below.

   - **SERIAL (RS 232)**. Use the serial adapter with a branch for the local computer mouse. The serial adapter is fitted with a 9 pin DSUB connector. Use an extra 9 to 25 pin adapter (available from your dealer) if your computer has a 25 pin serial connector. Connect your computer mouse to the free branch of the adapter if desired. With some computers, the branched adapter may not work. For this purpose, an optional straight serial adapter is available.

   - **PS/2**. Use the PS/2 adapter that connects directly to your computer mouse port. Running the computer mouse in parallel is not possible, unless your computer itself has provision for two mice simultaneously. You may consider using the above serial adapter and run your mouse on the serial port instead, in order to be able to run your local mouse in parallel. This will require a different mouse driver setting. Please consult your computer documentation or local dealer for details.

   - **MAC**. Use the MAC mouse adapter to connect to the mouse port on your MAC computer.

5. **MAINS POWER.**
   Connect the mains cord to the projector and all other equipment in the set-up.

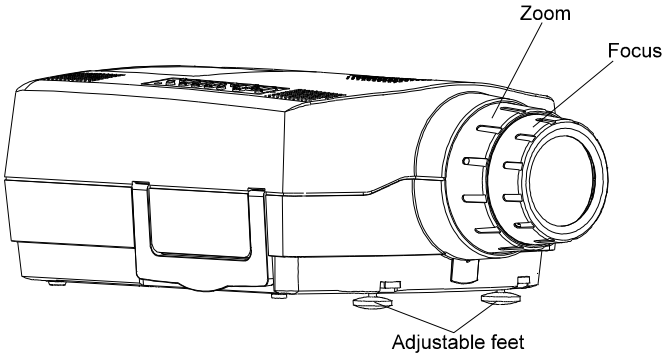
6. **SWITCH ON** the projector first, then the computer. It is important to switch the projector on first in order for correct detection of the projector as a display and mouse peripheral device to the computer.

7 IMAGE ADJUSTMENTS

This section will aid in adjusting a stable, flicker-free image for best viewing results.

Use the remote control or the projector keypad to adjust settings, either directly or through the menu system.

The following list aids in a trouble free set-up of the projector. Try using a patterned background (tiles, checkerboard pattern etc) when adjusting the image.



1. **ZOOM, FOCUS AND POSITION IMAGE**. The projection lens has a manually adjustable zoom and focus. Place the projector at a suitable distance to the projection screen, alternatively zoom the image, to obtain the desired screen size. (See the Technical Data section for max and min projection distances.) Focus the image and observe that the picture elements (pixels) become sharp on screen. The projector has two adjustable feet in the front, so that the image can be shifted to a desired height on the wall. Tilt the projector body in the desired position and press the foot-release buttons. If necessary, fine adjust the height by screwing the feet either direction.

2. **RESET** in most cases automatically adjusts the image position, width (FREQUENCY) and stability (TUNE). If RESET fails to adjust the image correctly, see FREQUENCY, POSITION and TUNE below. RESET is automatically activated when a new source is connected.

3. **SCALE** the image as desired if you are viewing a lower (VGA) or higher (XGA) resolution image. Scaling will fill the viewable area by enlarging a lower resolution or compressing a higher resolution image. If you do not

scale a higher resolution image, you may choose to PAN around instead in order to view parts of the image.

4. **CONTRAST** and **BRIGHTNESS** may be adjusted according to your personal taste, the image and the viewing conditions. The controls are directly accessible on the remote control and on the projector keyboard.

5. **FREQUENCY**. The frequency controls the width of the image. A wrong frequency setting can be seen as equally spaced, vertical stripes or irregularities in the pattern displayed. Press the MENU key, SET-UP, FREQUENCY and press ENTER. Adjust the value up or down using the trackball or keyboard cursor controls, observing that the amount of vertical stripes reduces, until the distortion is gone. You may still have an unstable image, please see the next section.

6. **POSITION** the image correctly by accessing SET-UP, POSITION, then press ENTER and adjust position with the trackball or keyboard cursor controls

7. **TUNE** the image for a stable projection. In the menu, select SET-UP, TUNE and press ENTER. Adjust stability using the trackball.

Set-up should be done once with the source(s) you are using most frequently. Allow some minutes for the unit to warm up before adjusting the settings. Most settings will be memorized individually for each source for future use.

8 USING THE PROJECTOR

The projector has a set of features and functions you should familiarize with in order to get the most out of using the unit.

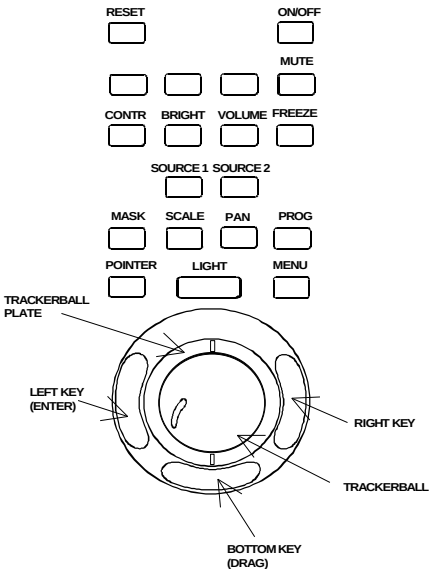
Further information is provided in the Advanced Features section.

8.1 REMOTE CONTROL

The remote control is used to adjust the projector for the best possible image, either directly or through the menu system. It is also used during presentations for computer mouse control and with special presentation tools.

	The remote control may be pointed directly at the projector front, where the receiver is situated, or indirectly by pointing at the projection screen. When pointing at the screen, point at an angle that reflects the beam towards the projector.

The trackball is by default controlling the computer mouse (if the mouse cable is connected properly). With some functions, like POINTER, MASK and in the menu system, the mouse control is disabled.



In the menu system, the trackball is used for navigation between the different alternatives, and when a function is selected, the trackball is used for adjustment of that function.

The following table describes each key in detail. Some functions are memorized, while other functions are only momentary.

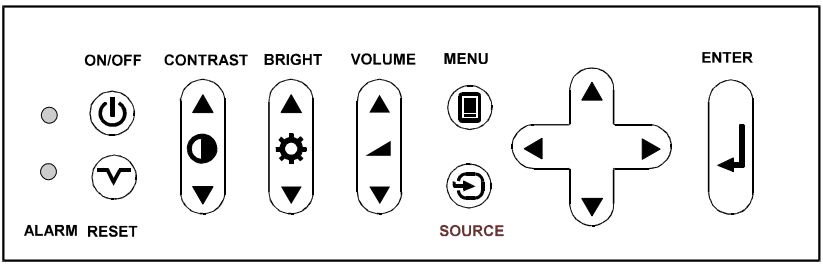
The MEM column indicates whether the function setting is memorized.

KEY	FUNCTION	MEM
CONTR	Contrast is the ratio between light and dark colors.	Yes
BRIGHT	Brightness (whiteness) of the image can be altered to suit local lighting conditions.	Yes
VOLUME	Volume of the audio output can be altered to suit local conditions.	Yes
ON/OFF	Turns the projector into standby mode. Switches the projection lamp off, but leaves power on to the rest of the projector.	-
RESET	Automatically adjusts the image correctly	-
MASK	Applies a mask to the image, which can be moved up and down using the trackball.	-
PROG	This key may be programmed to any one of the menu controls.	Yes
MUTE	Switches the sound on/off.	No
FREEZE	Holds the image projected on the screen. This feature can be used to hide actions on the computer that the audience need not see, such as changes between software packages, or for returning the audience's attention back to the presenter!	No
SOURCE 1&2	Selects between SOURCE 1 and SOURCE 2 as the active source.	No
POINTER	Applies a trackball controlled pointer to the screen.	No
SCALE	Selects between direct 1:1 mapping or scaling of images.	No
PAN	Allows panning within oversized images using the trackball.	-
LIGHT	Press to illuminate the keypad.	-
MENU	Invokes the menu system.	-
TRACKBALL	The trackball is mainly used to control the mouse pointer (if the mouse cable is attached properly). When SCALE, MASK, PAN or MENU	-

KEY	FUNCTION	MEM
	is invoked, mouse control is disabled, as the trackball is used to control these functions instead. Trackball sensitivity, except for the mouse, is set under OPTIONS in the menu system. Mouse sensitivity is set at your computer as with the standard mouse.	
RIGHT	Emulates the right mouse key.	-
BOTTOM/ DRAG	This emulates the 'click-and-hold' function of the desktop mouse. Use DRAG instead of RIGHT key when connected to a Macintosh computer.	-
LEFT/ ENTER	Emulates the left mouse key. Once the menu is accessed selections are confirmed using ENTER.	-

8.2 PROJECTOR KEYBOARD

The keypad on the projector gives access to all controls, either directly or through the menu system.



KEY	FUNCTION	MEM
CONTRAST	Contrast is the ratio between light and dark colors.	Yes
BRIGHT	Brightness (whiteness) of the image can be altered to suit local lighting conditions.	Yes
VOLUME	Volume of the audio output can be altered to suit local conditions.	Yes
ON/OFF	Turns the projector into standby mode. Switches the projection lamp off, but leaves power on to the rest of the projector.	-
RESET	Automatically adjusts the image correctly	-
SOURCE	Toggles between source 1 & 2	-
MENU	Invokes the menu system.	-
CURSOR KEYS	The cursor keys are used to navigate in the menu system	-
ENTER	Emulates the left mouse key. Once the menu is accessed selection are confirmed using ENTER.	-

INDICATOR	FUNCTION
ON/OFF *DPMS modes*	• NO LIGHT indicates that the unit is completely switched off by the mains switch • GREEN indicates that the unit is operational • YELLOW indicates that the unit is in standby mode (switched off using the remote control or the keypad) • GREEN/YELLOW FLASHING FAST indicates that the projector is in stand by mode (searching for source) with a fast recovery time. • GREEN/YELLOW FLASHING SLOW indicates that the projector is in suspend mode with a power reduction and longer recovery time. The projection lamp is shut off.
ALARM	• RED indicates lamp lifetime overdue.

8.3 THE MENU SYSTEM

The menu system is designed to gain access to functions not often used, as opposed to frequently used features that are directly available through the remote control and the projector keypad.

Press the MENU key to invoke or exit from the menu system. When the menu is active, the trackball is used to navigate between options (and therefore is not available for mouse control etc. at the same time). The ENTER key is used to activate or deactivate a function.

The PROG key may be assigned to any of the menu functions.

Toggle functions (like OSD, REAR etc) are tagged when active and untagged when not active.

Increase/decrease functions (like TUNE and FREQUENCY etc) are adjusted using the trackball or keyboard cursor controls. The OSD field (in the lower left corner of the screen) indicates the actual settings.

The menu system is toggled on and off with the MENU key. The MENU is also switched off after one minute of inactivity. Most settings are memorized unless otherwise noted.

The main menu selections SETUP, SOUND, OPTIONS and HELP are explained in detail below.

Features available with some sources only are shown in grey color characters, while generally available functions are in normal case.

8.3.1 THE SET-UP MENU SELECTIONS

TUNE is used to stabilize the image. An untuned image can be seen as sideways instability or “swimming”.

FREQUENCY is provided to adjust image width. Generally, an incorrect frequency setting can be observed as an image too wide or too narrow, combined with vertical, unstable bands.

POSITION. Due to minor variations in graphic cards, the horizontal and vertical position may need adjustment. Select POSITION, then press LEFT and use the cursor keys or trackball.

REAR inverts the image for use in rear projection arrangements i.e. projection from the back of a screen.

CEILING switches between an upright and an upside-down projection by flipping the image vertically.

MAC (832 X 624) enables detection of this specific source. Some SVGA sources with equal or more total lines will then be treated as MAC (832 X 624). In those cases, turn this function off.

COLOR TEMP. (Color Temperature) adjusts the red and blue color components.

FACTORY RESET. This function resumes factory settings of all parameters.

8.3.2 THE SOUND SELECTIONS

TREBLE controls the higher sound range.

BASS controls the lower sound range .

BALANCE controls the sound balance between the two stereo speakers.

EXTERNAL toggles between internal speakers and the audio line output. The audio line output is used to connect external speakers through an external amplifier.

8.3.3 THE OPTIONS SELECTIONS

HIDE OSD switches the on-screen echoing of controls on and off. This setting only affects the direct control operations, not the menu system. This setting is not memorized.

SOURCE SEARCH is a toggle function that controls whether the projector shall automatically search for an active source or not. Manual source selection is maintained between active sources. Source priority is SOURCE 1 then 2. If SOURCE SEARCH is off (not tagged), the manually selected source is maintained, regardless of signal presence. If SOURCE SEARCH is active, the projector will switch to the next priority active source, regardless of manual selection.

VESA DPMS (Display Power Management Signalling). System initiating power down of the projector to avoid image imprint on the module. Regulates the various on/off/stand-by and suspend modes and signals the condition to the keyboard LED-indicators. Refer to the *Projector Keyboard* section for details.

TRACKBALL SENSITIVITY. Controls the response of the remote control trackball in the menu system. (It does not affect the response of the computer mouse. Please adjust mouse sensitivity on the computer). FAST, MEDIUM and SLOW are available options.

LANGUAGE. A selection of languages is available for the menu options, including English, German, French, Italian, Spanish, Norwegian, Japanese, Korean and Chinese. Other languages may apply.

POINTER selects the pointer appearance. Options include BALL, ARROW and CROSS. Other shapes may apply.

MASK selects whether the mask is applied downwards or upwards.

SERVICE is used to reset the lamp timer.

8.3.4 THE HELP SELECTIONS

SOURCE INFO provides a status list of parameters relating to the source selected.

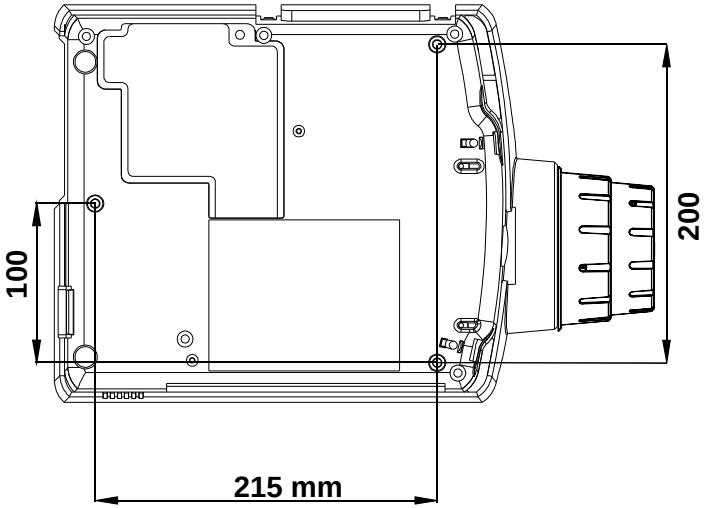
ABOUT provides system information about the projector.

9 CEILING MOUNTING

The projector is prepared for ceiling mounting. As opposed to desktop use (most tables are approx. 80 cm tall, are flat and have a hard surface finish), ceilings vary in height and material. Also considerations must be made with respect to signal and power wiring.

9.1 SELECTING A MOUNT

Various mounting systems are available from different sources. Contact your dealer for further details or consult vendor catalogs. Be sure that the vendor has tested the mount with this specific projector for operational safety. Check that the mounting brackets fit the integral M4 screw mounts (see illustration below) of the projector, and that the ventilation slots are not blocked.



9.2 MOUNTING IN THE CEILING

An improperly mounted projector is a potential danger to people and equipment. A projector and mount falling down may cause personal injury and material damage. Such damage caused by bad workmanship in mounting and operation may lead to legal action and should be avoided.

Avoid ceiling mounting of the projector in areas of frequent or probable earth quakes.

When fixing the mount in the ceiling, be sure to check the ceiling material and if it will hold the total weight of the mount and the projector. Look for wood, steel beams or concrete that will secure a good and lasting fixture. Avoid plaster or other fragile materials that do not have sufficient structural properties. Follow the detailed instructions supplied with the ceiling mount for proper mounting and operation.

After having mounted the projector in the ceiling, test if the holding force is sufficient by adding a load to the mount at least double the weight of the combined projector and mount. The mount should hold this extra weight with no sign of fatigue and with no sign of mounting screws loosening.

9.3 WIRING

Ceiling mounted projectors require long signal and power wires.

The signals should be wired using high quality coaxial cable. The cables usually need to be customized. Some vendors have specialized in this field. Contact your dealer for further detail.

If the signal cables run over a longer distance from the source to the projector, a line buffer (distribution amplifier) may be needed (available from third party vendors).

For potential fire reasons, the power wiring should be separately switched so that the projector can be switched off completely when not in use. The ON/OFF on the remote control only suspends operation of the projector without switching off completely.

10 YOUR PROJECTOR IN DETAIL

The projector is designed from the ground up to be a compact, durable, bright and versatile device that is suitable for use in various indoors projection applications.

International mandatory regulations are employed, including the rigorous European CE and American UL and FCC standards that cover safety and radio interference issues.

Product packaging is by environmentally friendly materials that are recyclable and that do not emit any toxic fumes if combusted. The 'RESY' and 'Grüne Punkt' marks are referenced (with ID numbers), indicating that the proper fees are already paid for controlled return of packaging material.

The projector powers down according to the latest standards to minimize power consumption when the source connected becomes inactive (by lack of activity or when the source is switched off). Operation is automatically resumed when the source again becomes active, though some delay is incurred when restarting the projection lamp.

To allow for flexible operation and installation, the unit may be operated from the tabletop, ceiling mounted or in a rear-projection arrangement. Safe thermal operation is secured through a temperature controlled, well dimensioned cooling system that is minimizing fan noise and stray light.

Compatibility is wide, including most popular computer sources from VGA (640x480 expanded) to XGA (1024x768 compressed) resolution.

A wide mains voltage operating range is employed, and connection is through the internationally recognized IEC connector. The menu system is multi-lingual.

The following chapters detail various features of your projector that may be of interest.

10.1 SLB - SMALL, LIGHT AND BRIGHT

The projector was designed to be the ultimate portable projector.

The advanced, miniaturized optical design and the use of a relatively low power, high efficiency illumination system combined with optimalized electronics has yielded a very compact, lightweight projector.

10.2 AUTOMATIC SETUP

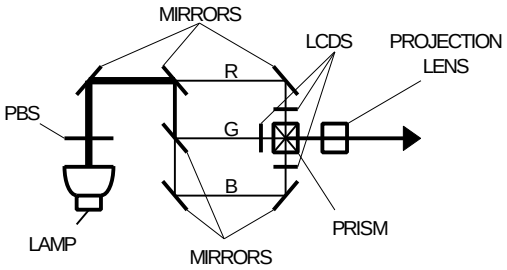
The projector always seeks to adjust the projected image automatically. The user may also at any time invoke the autoadjust function by pressing RESET. When auto is operating, the image will be shifted to different positions on screen for about 5 seconds before it is stabilized.

10.3 POLYSILICON TFT LCD TECHNOLOGY

The light valve technology employed in the projector is based on small TFT (Thin Film Transistor) LCDs (Liquid Crystal Displays) manufactured in a high temperature process enabling the formation of so called PolySilicon transistors. These transistors are used both as switching elements at each picture element (pixel), and for other electronic signal handling.

10.4 BASIC OPTICAL SYSTEM

The projector is based on three PolySilicon TFT LCD light valves, one each for the primary red, green and blue colors of the spectrum. Any other color may be produced by combining various amounts of these primary colors. High brightness is made possible by novel techniques for improved light collection in the illumination system and better distribution through the optical system. A special PBS (Polarized Beam Splitter) is employed to reduce the traditional loss of light that is normally associated with LCD systems using polarized light.



A high efficiency discharge lamp that contains specially formulated metal halides produces a bright, white light with a well balanced spectral

distribution. The white light is then split by dichroic mirrors in three rays of the primary colors red, green and blue. These beams are then directed to one each of the three LCD valves. Depending on the control of these three LCDs, where each primary component of the image is separated, light is let through or blocked. The beams are then recombined in a prism and directed to the projection lens.

The projection lens has zoom and focus rings available to the user in order to be able to select a suitable magnification (image size) at a given projection distance, and to adjust for a sharp image.

10.5 TRACKBALL REMOTE CONTROL

The remote control enables both set-up of the projector and control both of the projector and the computer mouse pointer during operation.

The mouse functionality duplicates the local computer mouse without the need for any special software drivers.

10.6 MENU SYSTEM

The menu system is designed so that it may be invoked and overlayed at any time with any image projected. When invoked, the menu system will not interrupt the display of the underlying image. The hierarchical design, with a main menu and sub-menus, provides a logical approach to access the various functions. The localization in the upper left corner and the moderate size of the menus does not block much of the view of the image displayed. Several languages are selectable to suit international users from east and west.

10.7 OSD SYSTEM

The OSD (On Screen Display) is used to echo user controls for positive feedback. The OSD is active both within the menu and with direct controls. The OSD should not be confused with the menu system, the latter being used to gain access to controls, while the OSD merely indicates the actual operation. The OSD may be selected or deselected in the menu.

10.8 SET-UP MEMORY

The various user selections and settings that are made with the remote control, the projector keypad and the menu system, are automatically memorized for future reference. Most settings are related to the actual source in use, so when switching between sources, or between modes within sources, the individual settings are recalled accordingly.

The memory can store up to 40 different sources and mode characteristics. Some sources are predefined, while the remaining are available for customer set-up. See the compatibility list in the Technical Data section.

New sources are added to the memory only if the sync pattern differs significantly from a previous selection. If a new source is detected as an old one (close or identical sync patterns), and the settings are changed, the new settings will override the old ones.

See the Remote Control and Menu sections for details of which functions that are memorized.

10.9 COOLING SYSTEM

The heat generated in the projection lamp and in the electronics circuitry needs to be effectively vented out of the projector. Cooling fans are employed to force the convection of air through the system. Air is let out close to the projection lamp (as this is the hottest area).

The projector is designed to operate at a wide temperature range and works well when ceiling mounted, even at high ambients. See the technical Data section for temperature specification.

The cooling system is temperature controlled, so that when operated on the desktop at normal temperature, the noise level is minimized due to a relaxed fan speed. When operating in the ceiling under high temperature ambients, the fan runs at a higher speed to maintain cooling while the noise level increases. The light leakage out of the vents is minimized by a special light blocking design of the vent flanges.

11 APPLICATIONS

The projector is perfectly suited for a variety of different applications including portable use, work groups, teaching, training, home theatres, control rooms, product promotion, shows, simulators and more…

11.1 PORTABLE USE

The projector is designed with portability in mind for the nomadic user. The footprint is small and the weight is low. The unit is employed with an integral handle, and is supplied with a soft carrying case holding the projector and all cables. The unit can be carried on-board an aeroplane and fits easily in the overhead locker. Remember that the projector is a delicate instrument containing precision optics. Avoid bumping and dropping the unit during transportation. When checking the unit in at the airport, ensure proper packaging to avoid breakage and malfunction. It is wise to bring an extra projection lamp, just in case…

11.2 WORK GROUPS

A work group typically involves a group of people actively involved in discussions round the table. The projector usually is connected to a networked computer. As the meeting evolves, various documents are continuously updated and corrected. Information is downloaded from the Internet or the company Intranet for up-to-date processing in the group. By the end of the session, the documents are wrapped up and minutes are distributed to the various recipients over the e-mail system. The projector may be placed on a table or permanently installed, either ceiling mounted or arranged for rear projection.

11.3 TEACHING

Educational institutions would use the projector both for traditional computer based teaching for the class, as well as interactive use over the Internet. By using the projector, the attention of the students is focused on a single large projection screen, supplementing the ordinary, individual computer monitors when needed. The projector may be placed on a table or permanently installed, either ceiling mounted or arranged for rear projection.

11.4 TRAINING

The projector is ideally suited for company training in various areas such as products, software, organisational and staff continued education. It is practical for this purpose to have a dedicated training room with good facilities for each individual in order to secure the attention of each person during the training session. The projector may be placed on a table or permanently installed, either ceiling mounted or arranged for rear projection.

11.5 CONTROL ROOMS

Large screen projection of critical information enables a quicker and more consistent reaction to any change that needs immediate attention. This includes both manufacturing process control, as well as operational control in private, public and military situations. Several projectors may be cascaded or grouped to simultaneously project over a larger area or to project different screens simultaneously, using a dedicated screen splitter (available from third party suppliers). These applications are typically fixed and the projectors are usually either ceiling mounted for front projection or arranged in a rear-projection set-up.

11.6 PRODUCT PROMOTION

The projector is ideally suited to attract attention in order to promote sales of all kinds of products in shops and malls. The promotion material may be either computer generated based. Several projectors may be employed simultaneously to increase attention further. The projector is usually semi-permanently installed, either ceiling mounted or arranged for rear projection.

11.7 TRADE SHOWS

Many companies attend various trade shows throughout the year. In these situations, the key issue is to attract the attention of a large, continuously moving public. One or more units projecting your company message will help steering the crowd to your business. The projector might be either placed on the table top, ceiling mounted or used for rear projection. Since control over lighting conditions is difficult at trade shows, arranging two projectors on top of each other projecting, the same image on the same screen will help by increasing the brightness.

11.8 SIMULATORS

Simulators are used in various applications for training and entertainment. Professional use includes car driving, air plane and ship vessel control training, as well as other expensive and often dangerous situations that require well trained personnel. Entertainment use is basically in various theme parks etc.

12 TROUBLE-SHOOTING

This is a checklist to help you pinpoint any problem that may arise. Check the symptoms carefully if you experience any problem. The cure may be at your fingertips!

	Always check that the ON/OFF indicator on the projector flashes when a key on the remote control is pressed. This indicates that the projector is receiving signals from the remote control.

SYMPTOM	SOLUTION
The projector does not work	• Check if the mains cable is attached properly. • Check that the Power switch is ON. • Toggle the ON/OFF button on the remote control.
The projected image is completely black	• Check that the Power switch at the mains inlet is ON. • The unit may have overheated due to the ventilation slots being covered while the projector was in use. Also ensure that the ambient temperature is within spec. Check the air inlet filter, as it may need vacuuming (see *Maintenance*). Wait until the unit has completely cooled down before using again.
The projected image is too dark or too light.	• Adjust the CONTRAST and BRIGHTNESS settings. • Press RESET, which will remove the pre-determined settings for the current source, and make the set-up adjustments again.
Some colors are unstable or flickering	• Check first that there are no loose cable connections. • You can try to adjust the image quality with the CONTRAST and BRIGHTNESS keys. • Try to improve the tuning by accessing TUNE in the menu system.

SYMPTOM	SOLUTION
The whole image appears to be unstable or misplaced	• If the image is scaled, press SCALE to return to the default mode. • Adjust the frequency and tuning settings (instability), or the image position settings (misalignment). • Check that you are using a source with compatible resolution. • The projector may be connected to a source with a non-standard computer (or video card). Adjust the frequency and position of the image.
Cooling fan is not working	• Check that the Power ON/OFF switch is ON. • If the fan does not work the projector **must not be used** and should be returned to your dealer for repair.
The remote control is not working	• Make sure you point the remote control at the projection screen or directly at the IR receiver • The maximum range of the IR transmitters is 15m (50 feet) - Are you standing close enough? • If the effective range of the transmitters is significantly reduced, the remote control needs new batteries.
The desktop mouse is not working	• Remember that the mouse must be connected before the computer source is switched on. • Are the mouse cable and mouse adapter connections secure? • Check the mouse driver settings on the computer • You must boot the computer after the cable has been connected for it to recognise the mouse. If you are unsure whether this was the case, reboot your computer.

13 MAINTENANCE

The projector needs very little maintenance in order to function properly.

13.1 GENERAL

Use a damp cloth to wipe off dust on the exterior. Clean the lens with a damp, non-abrasive cloth, using just water or a standard lens cleaning solution available from photographic dealers.

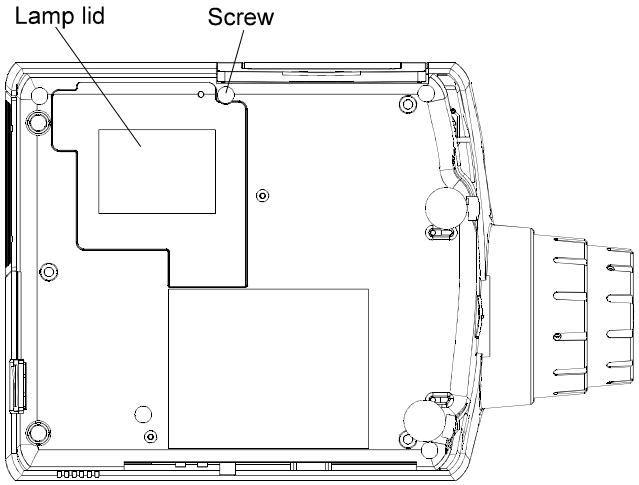
Vacuum the air inlets periodically, especially when build-up of dust is observed. This will ensure cool operation of the unit.

Do not scratch the lens surface. Use the lens cap when the projector is not in use for added protection. Remember to remove the lens cap before operating the unit!

13.2 LAMP REPLACEMENT

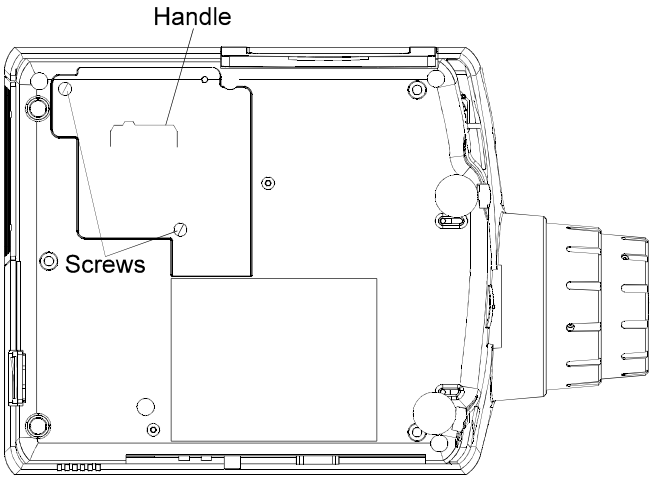
The projector is using a custom metal halide lamp for illumination. The lamp is high pressure when hot (operating or immediately after switch-off). Lamp pressure is normal when cold.

A lamp timer is available in the menu system under HELP, ABOUT, that may be used to track lamp operating time. The timer may be reset by the user.



Projector seen from below

To change lamp, unscrew the lamp lid. A safety switch will cut off the power supply to the lamp completely. Unscrew the lamp holder, fold out the handle and pull out the old lamp holder. Insert a new lamp.



Projector seen from below

Push the lamp holder all the way until it positively stops and mount the screw. Fold the handle and remount the lamp lid. Mount all screws well.

	Use only original lamp and holder as specified. The lamp is individually adjusted with the holder to maintain optimum illumination. Replacement using a different lamp may result in poor illumination, malfunction (potentially explosion) and will void any warranties.

To reset the lamp timer, invoke the menu system under OPTIONS, SERVICE, LAMP TIMER RESET. You need to confirm that you actually intend to reset the lamp timer, or cancel if you accidentally invoked the function.

13.3 THE REMOTE CONTROL

The infrared remote control requires little maintenance.

The trackball element may be cleaned occasionally with a damp (not wet) cloth. To take out the ball, twist the ring holding the ball anti-clockwise. Having taken out the ball, you may also clean the trackball interior using a damp (not wet) cotton swab.

To change the batteries, open the battery holder on the rear of the handset. Remove the old batteries and dispose of carefully. Insert new batteries of the type described in the *Technical Data* section, observing the polarity instructions inside the battery holder, and close the clip-shut door. Test that the remote control functions correctly by pressing the LIGHT key to see if the backlighting operates properly.

14 TECHNICAL DATA

The technical data given in this section was correct at the time of going to print, but may change without prior notice in order to improve product performance.

This projector is designed for indoor use and should not be operated or stored in conditions outside the general environmental limits given in section below, as this may lead to permanent damage and will violate any warranties.

14.1 GENERAL ENVIRONMENTAL LIMITS

Storage temperature	-20 - 60°C (-4 - 140 F), sea level
Storage humidity	10 - 90 % relative humidity, non-condensing
Operating temperature	10 - 30°C (50 - 86 F) ambient, sea level
Operating humidity	20 - 80 % relative humidity

Allow for slow acclimatization after storing at extreme temperatures and humidities, to avoid condensation. Should condensation appear, leave the projector unit in a controlled environment within the operating limits until the condensation has evaporated before using the projector.

14.2 PROJECTOR UNIT

PROJECTOR DIMENSIONS (H x W x L)	137 x 249 x 295 (375) mm / 5.4 x 9.8 x 11.6 (14.7) inch
PROJECTOR WEIGHT	5 kg / 11 lbs
PROJECTION LENS	Manual zoom and focus lens 1.3 zoom ratio f 45-59 mm F 2.5-2.9
IMAGE SIZE	0.76 - 7.6 m / 30 - 300 inches (wide) 0.58 - 5.5 m / 23 - 230 inches (tele)
PROJECTION DISTANCE	1 - 10 m / 3.3 - 33 ft
ANTI-KEYSTONE CORRECTION	12 degrees
PROJECTION LAMP	150 W metal halide
LIGHT OUTPUT	500 ANSI lumen
CELL	1.3” polysilicon TFT LCD
COLOR RESOLUTION	16.7 million
CONTRAST RATIO	300:1
PIXEL RESOLUTION	800 x 600 x 3
DEFECTIVE PIXELS	10 (max)
VIDEO FREQUENCY	12 - 150 MHz
HORIZONTAL SYNC	15 - 100 kHz
VERTICAL SYNC	43.5 - 130 Hz
COMPUTER INPUT	0 - 1 Vpp
AUDIO INPUT	1V RMS
SPEAKERS	2 x 1 W, four speakers
APPROVALS	• CE • UL • cUL • FCC Class A, Subpart J, Part 15

14.3 POWER SUPPLY

DUAL VOLTAGE	100 - 120 VAC, 60 Hz, +/- 10 % 220 - 240 VAC, 50 Hz, +/- 10 % 250 W

14.4 REMOTE CONTROL

UNIT SIZE (H x W x L)	20 x 50 x 190 mm / 0.78 x 1.97 x 7.48 inch
UNIT WEIGHT	146 g / 0.32 lb. (with batteries)
BATTERIES	4 pcs LR03/AAA 1.5V penlight
FUNCTIONAL RANGE	15 m / 50 ft
COMPATIBILITY	Microsoft 2-key serial; MAC; PS/2
APPROVALS	CE, FCC Class A

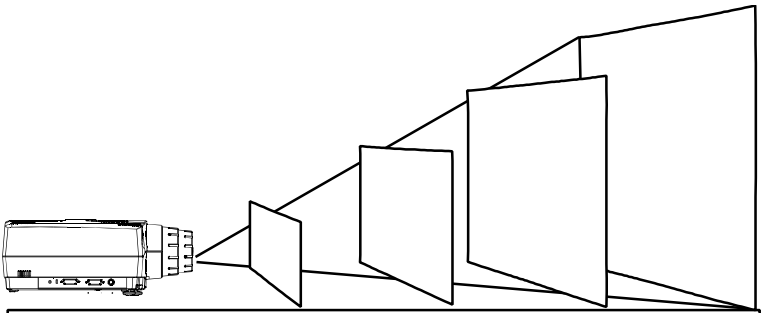
14.5 COMPATIBILITY

The projector is compatible with the interfaces and resolutions shown below, some of which are predefined. However since different varieties of these exist, a frequency adjustment may be needed.

MODE	RESOLUTION
Generic	640 x 350 640 x 400 640 x 480 720 x 480 800 x 600 1024 x 768 (compressed)
VGA	640 x 350 640 x 400 640 x 480 720 x 400
SVGA	800 x 600
XGA	1024 x 768 (compressed)
MAC	640 x 480 832 x 624 1024 x 768 (compressed) 1152 x 870 (compressed)

14.6 PROJECTION DISTANCES

The following table shows the combinations of projection distances and screen sizes that are possible.



	MINIMUM			MAXIMUM
WIDE				
DISTANCE	1.00m/ 39”	3.00m/ 118”	7.00m/ 276”	9.00m/ 354”
DIAGONAL	0.80m/ 31”	2.30m/ 91”	5.50m/ 217”	7.00m/ 276”
WIDTH	0.64m/ 25”	1.84m/ 72”	4.40m/ 173”	5.60m/ 220”
HEIGHT	0.48m/ 18”	1.38m/ 54”	3.30m/ 130”	4.20m/ 165”
TELE				
DISTANCE	1.00m/ 39”	3.00m/ 118”	7.00m/ 276”	9.00m/ 354”
DIAGONAL	0.60m/ 24”	1.80m/ 71”	4.20m/ 165”	5.40m/ 213”
WIDTH	0.48m/ 19”	1.44m/ 57”	3.36m/ 132”	4.32m/ 170”
HEIGHT	0.36m/ 14”	1.08m/ 43”	2.52m/ 99”	3.24m/ 128”

Please consider the values given as nominal, with a variation of +/- 10 %.

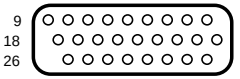
15 CONNECTORS

The connector ports for the source equipment on the projector are located on the right hand-side (when facing) of the unit. The pinouts of all the connector ports is described in this section.

	Do not connect any devices or cables other than those supplied with the projector into the connector ports on the projector unit, even if the connector ports appear identical, as this voids any warranty and may cause permanent damage to the projector.

15.1 SOURCE 1 & 2

This connector relays all signals from the computer to the projector, and also back to a local CRT monitor if required.

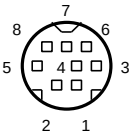


26 PIN HIGH DENSITY DSUB
FEMALE (FRONT VIEW)

1 ANALOG R IN	10 ANALOG R GND IN	19 HSYNC IN
2 ANALOG G IN	11 ANALOG G GND IN	20 C/VSYNC IN
3 ANALOG B IN	12 ANALOG B GND IN	21 DIGITAL GND
4 RESERVED	13 RESERVED	22 RESERVED
5 RESERVED	14 RESERVED	23 RESERVED
6 RESERVED	15 RESERVED	24 DIGITAL GND
7 ANALOG R OUT	16 ANALOG R GND OUT	25 HSYNC OUT
8 ANALOG G OUT	17 ANALOG G GND OUT	26 VSYNC OUT
9 ANALOG B OUT	18 ANALOG B GND OUT	

15.2 MOUSE

This port is used to relay mouse signals from the projector to the computer.



8 PIN MINIDIN
FEMALE
(FRONT VIEW)

1 MAC ADB	5 RS232 RTS
2 PS/2 CLOCK	6 RS232 RXD
3 PS/2 DATA	7 RS232 CTS
4 RS232 TXD	8 GND

15.3 LINE OUT

This connector is used for stereo sound output.

3.5 mm
JACK
(FRONT VIEW)

TIP	RIGHT
RING	LEFT
STEM	COMMON

16 ENVIRONMENTAL HANDLING

Care has been taken in the manufacture of this projector so that environmental stress and pollution has been minimized. No CFCs are used during the manufacture of the unit. Where possible, recyclable materials have been used to minimize the environmental impact.

The delivery packaging can be recycled without further ado.

With respect to the projector unit itself, thought should be given to the eventual disposal of the unit in the most environmentally friendly manner considering the mechanical, electronic and chemical components inside. If possible, return the unit to a speciallized company handling electronic waste.

17 FCC STATEMENT

This equipment complies with the limits for a Class A computing device, pursuant to Subpart J of Part 15 of FCC rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class A limits may be attached to a computer that complies with Class A limits. When connecting to a peripheral device, a shielded input/output cable is required to ensure compliance with FCC rules. The shielded cable that must be used is supplied with the equipment. Operation with non-certified peripherals or non-shielded cables is likely to result in interference to radio and TV reception.

This equipment generates and uses radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio and television reception. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of the FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

- Reorient the receiving antenna.
- Relocate the projector with respect to the receiver.
- Plug the equipment to a different outlet so that equipment and receiver are on different branch circuits.
- Fasten cables using mounting screws to ensure adequate EMI control.

You may require the following booklet from the Federal Communications Commission (FCC) : "How to identify and resolve radio and TV interference problems", available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.